ATOMIC ENERGY Newsletter

THE FIRST AND ONLY

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Dear Sir:

Two developments in the atomic weapons field have marked the last fortnight: the detonation by the Soviet Union of another atomic weapon, and the conclusion of a series of four atomic detonations in the United States. The Soviet atomic explosion was the second within the month, and the third in twenty-five months, an indication of that country's progress in atomic weapon manufacture. In the U.S., the USAEC activities, at its testing ground near Las Vegas, Nev., were the first "atomic warfare maneuvers" in the Nation's history; some 5,000 Army troops participated directly or indirectly in the exercises. Later this month, a new series of tests will attempt to learn how equipment used in battle will stand up under nuclear bombardment. Tanks, planes, cannon, etc., will go through "effects test" to see if they should be strengthened or even redesigned.

A one day symposium on the use of radioisotopes in the treatment of cancer will be a feature of the annual meeting of the American Association for the Advancement of Science, Philadelphia, Dec. 26-31, 1951. The morning sessions of the symposium (Dec. 28th), will be devoted to the use of internally administered radioisotopes such as radioactive phosphorous, iodine, and gold, while the afternoon session will be concerned with the external use of isotopes, notably radioactive cobalt. Speakers on the program will come from the Oak Ridge Institute of Nuclear Studies (one of the sponsors of the program), Chicago Tumor Institute, New York City Department of Hospitals, and the medical schools of the University of Michigan, University of Pennsylvania, and Temple University.

The Spanish Government has named Gen. Juan Vignon, Chief of the General Staff to head its "nuclear energy junta". According to the decree published in the official Gazette, nuclear studies will be furthered "within the possibilities of the Spanish State". Despite its naming of a military head, the Government said its objectives were to develop peaceful uses for atomic energy.

New director of the research division of the USAEC is to be Dr. Thomas H. Johnson, presently director of the physics department of Brookhaven National Laboratory. The position has been vacant since June 18th, 1951, when Kenneth S. Pitzer resigned to become Dean of the College of Chemistry, University of California.

Eight fellowships in industrial medicine are now to be offered by the USAEC for the 1952-3 academic year under a special program which the Commission began 2 years ago. The fellowships are open to U.S. citizens with an M. D. degree who have had at least one year of internship. Inquiries should be made to Dr. H. A. Blair, Atomic Energy Project, U. of Rochester, N.Y., where the program is being administered. Applications must be on file prior to Jan. 1st. 1952.

In an effort to prevent harmful consequences from improper disposal of radioactive wastes, the Chicago Board of Health, under Dr. Herman N. Bundesen, is setting up an advisory committee which will exercise control over such private users of radioisotopes as hospitals, cancer research foundations, industrial laboratories, etc.

Subscription rates: United States, U.S. possessions, and Canada, $18.00 a year. Latin America, $20.00 a year. All other countries, $25.00 a year.

The Search for Uranium; A special digest of remarks of Jesse C. Johnson, Director, Div. of Raw Materials, USAEC, before Amer. Insti. of Mining & Metallurgical Engineers, Mexico City, D.F., Oct. 31, 1951.

Uranium today occupies a unique position among the metals. Not only is it a material of great immediate military value, but its potential value for peacetime uses is the subject of extensive scientific investigations. Without doubt, uranium will continue to occupy a high position among strategic materials.

I would like to outline some of the measures which have been taken to stimulate the search for uranium in the United States. The first step we took in this direction was to establish minimum prices for uranium ores. As the Government was the sole purchaser in the end, the guarantee had to be for a number of years. A second part of the program is that of assistance to prospectors and the mining industry.

This assistance takes various forms. Prospectors and miners may call upon geologists of the Commission and the U. S. Geological Survey for advice and assistance, at no cost to them. Geological examinations are made of the promising prospects, and detailed reports and maps are given to the owners. Mining engineers of the Commission are frequently called upon to give technical advice on production problems. Mine operators are given information on extraction methods and, in the case of new types of ores, metallurgical processes are developed at Commission or contractor laboratories.

Additionally, the Commission carries on large-scale exploration work which has not been undertaken by private industry for economic or other reasons. Naturally, exploration methods vary from region to region, but no matter what topographic or geological conditions prevail, the USAEC avails itself of geological and geophysical techniques beyond the resources of the individual prospector. For instance, the USAEC has been able to experiment with such developments as airborne and carborne radioactivity detection devices.

Other important activities being carried out under our program include:

(1) Examination by the U. S. Geological Survey of samples from practically all operating mines, mills, and smelters in the United States to prevent the possibility that any potential uranium producers might be overlooked. This investigation was even extended to the examination of likely mineral specimens in museums, schools and other collections.

(2) Liaison with oil and mining companies to utilize information uncovered in their own exploration program. The companies contacted have cooperated fully. Gathering this information, however, is only part of the job. We have to establish a consistent, systematic method of evaluating it which will serve to increase our knowledge of conditions relating to uranium deposition.

(3) Technical experts have been "loaned" to the Commission for aid on problems where their highly specialized knowledge could be used to advantage. Here again, cooperation by private industry as well as universities and research institutions has been freely given to the Commission.

(4) Government laboratories, universities, and private organizations have been given contracts covering the development and improvement of metallurgical processes, analytical procedures, and radiation detection instruments.

(5) The information developed by the Commission's exploration and research is made available to the prospectors and the mining industry by publication of geological reports, direct contacts with those developing and operating uranium properties, and by other means.

This program, as outlined, has been in effect a little more than three years. As to results, uranium production in the U.S. has increased greatly. Many deposits have been discovered, and the area of known uranium occurrences has been greatly expanded. There probably are more individual prospectors looking for uranium than for any other metal. Large mining companies are making substantial investments in mines and plants, and many small operators and lessors are engaged in mining ore. Private organizations are doing hundreds of thousands of feet of exploratory drilling a year, and several are conducting airborne radiometric surveys.

RAW MATERIALS...radioactive minerals for nuclear work...

UNITED STATES - Shipments of ore consisting primarily of the mineral uranophane are now being made from the property of the Wyoming Uranium Corp., near Lusk, Wyoming. Reportedly, assay results have shown 0.25 to 0.30% uranium oxide content. Surface deposits are now being worked; the future of this property as a uranium producer will depend on the possibility of developing ore at depth.

CANADA - Interest in Nesbitt LaBine Uranium Mines was demonstrated last week when a public offering of 500,000 shares of this company, by the Canadian brokerage house of Bongard & Co., was oversubscribed three times. The shares were offered at $1.25; Bongard had acquired them from the company at 77¢ (100,000 shares,) and $1.00 (400,000). Shaft sinking is now getting underway on the company's Eagle Ace group. Next Spring it is proposed to sink a second shaft on the ABC group. Both properties adjoin the main Eldorado Mining & Refining property on the north. On the Eagle Ace group, which was acquired from Eagle Ace Uranium Mines, surface prospecting has uncovered 83 radioactive locations, 50 of which show visible pitchblende. Grab samples from eight of these showings assayed from 1.39% to 25.65% uranium oxide, according to the company prospectus. A high frequency of ore bearing fractures is reported in the northwest part of the property in a section known as the Eagle Lake fault zone. About 55 ft. east of this fault is an almost parallel fault. Twenty-six radioactive fractures have been found between these two faults, in a length of 1,800 feet. Some of these fractures have been proven to run from fault to fault. Visible pitchblende is reported to be in evidence in 16 of the 26 occurrences. They consist of typical pitchblende veins in a carbonate-hematite gangue.

Visible pitchblende, associated with native silver, has been found in the Cobalt area, although the economic importance of this new discovery is yet to be determined. The new find is on the property of Caneonti Mines Ltd., in Cane Twp., about 22 miles northwest of the town. Preliminary work has disclosed the presence of at least 24 parallel fractures, two of which show visible pitchblende. A small bulk sample from the same portion of the vein structure returned 149.8 ozs. of silver across a mining width of two to three feet. The ground was acquired several years ago by Ontigan Explorations Ltd., as a silver-cobalt prospect. The present operators, besides the extensive trenching program now getting under way, will carry out a detailed Geiger and scintillometer survey. As soon as this program is completed, it will be followed by a program of diamond drilling, to test the various structures at depth. The new find has excited considerable interest in the surrounding area, and has resulted in fairly extensive staking. Actually, radioactivity under-somewhat similar conditions has been found over four townships: Cane, Auld, Henwood, and Lundy. Immediately to the south of the Caneonti ground, Ontigan Explorers have tied up a group of claims embracing a showing at least a hundred feet long, giving moderate to high Geiger readings, over somewhat better widths than on the discovery group.

AT THE ATOMIC CITIES & CENTERS IN THE UNITED STATES...

ARCO, Idaho-The experimental breeder reactor here, which "went critical" last month, was the first of the new nuclear reactors at this reactor testing station to be started up. It is considered to be the nuclear reactor of the most advanced design and performance operating in North America, surpassing the Canadian NRX heavy-water pile at Chalk River, Ontario. Meanwhile, the materials testing reactor, and a land based prototype of a submarine reactor, are well along toward realization at this testing station.

OAK RIDGE, Tenn.-A new firm, Management Services, Inc., has now secured from the USAEC a 5½-year contract to handle all community services here, starting Jan. 1952 on a no-fee basis. The firm succeeds Roane-Anderson Co. (subsidiary of Turner Construction Co., New York), which has been doing this work since 1944, on a cost-plus fixed fee basis. Reason for the change was the ceiling of $90,000 per annum, as the maximum fee such community operators might charge at USAEC installations, which Congress recently set as a result of its dissatisfaction with the efficiency of the fee operators.

NEW PRODUCTS, PROCESSES & INSTRUMENTS...for nuclear work...

FROM THE MANUFACTURERS- New Laboratory monitor; model 1614A. Equipped with a 4-inch meter for ease in reading; selector switch permits the meter to indicate either count rate or Geiger tube voltage. The instrument covers five ranges from a maximum of 500 to a maximum of 50,00 counts/minute full scale, and is equipped in addition with a switch for selection of 2% ,5%, or 15% statistical accuracy. These accuracies are available on each range, since suitable time constants are automatically selected for each range. Model 1615A is supplied with a special magnetically mounted probe, which permits the thin mica window counter to be mounted on any iron or ferromagnetic object. Suggested uses are for monitoring vacuum lines; for bench top surveying; or for clinical and therapeutic checking when the counter is mounted in a lead shielded probe. -- Nuclear Instrument & Chemical Corp., Chicago, Ill.

NEWS & NOTES- As a result of the techno-economic survey of industrial uses of radioactive fission products, conducted by Stanford Research Institute, Calif., for the USAEC it has now been determined that a potential large-scale demand for such fission products does exist in industry. However, many technical and economic problems must be solved before these new uses can develop. The survey was concerned with the process wastes, now an unwanted "by-product" from the production of plutonium in the Hanford, Wash., nuclear reactors, which contain millions of curies of radioactivity. Of no usefulness for industrial or explosive power or as a heat source, these fission products are known to be a potential source of large quantities of low-cost radiation. Refinement and concentration of the gross fission products, now stored at USAEC installations, will, of course, be necessary to make them suitable for industrial purposes.

Present commercially feasible industrial uses (the Stanford survey found), include the activation of phosphors for self-luminescent signs and markers, static eliminators for a variety of industrial processes, the reduction of starting voltage requirements in fluorescent light tubes and in process control instruments which incorporate a source of radiation.

Possible future uses for fission products (Stanford's survey indicated), where the technology and desirability of use will require at least two to five years for development, include industrial radiography, cold sterilization of drugs and foods, and portable low-level power sources. In the highly speculative area where basic technical knowledge is lacking, possibilities exist for uses in radiation chemistry and flame propagation.

Stanford found that heat sensitive drugs, pharmaceuticals, and medical supplies are a most promising potential market for cold sterilization with gamma rays. This is due to the high cost of present methods of assuring sterility in heat-sensitive materials, the improved certainty of sterilization by radiation, and the high value of the end products. Food sterilization without heat offers many attractive potential markets for fission products, primarily because of the possibility of obtaining unique final products that cannot be obtained economically by known means. The largest market groups include meats, fresh fruits, fresh vegetables, beverages and miscellaneous perishable food products.

Toxological testing will have to be a part of the experimental and developmental program for any sterilization processes contemplating the uses of fission products radiation, the Stanford study showed. However, it was found that fission products can be used with safety by industry and that there is no danger that secondary radiation would be induced into products that are treated with fission product radiations.

The possible industrial advantage in use of fission products, according to the Stanford survey, lies in their potential ability to produce certain types of radiation at less cost or in more convenient forms than presently available sources. Fission product gamma rays would be considerably cheaper for similar uses than comparable X-rays from machines and would perform functions that cannot be accomplished by cathode rays from existing machines because gamma rays will penetrate through much greater thicknesses of material. Where radiation dosage requirements are small and numerous, beta-emitting fission products are considered more practical than machine sources of cathode rays. (Note: A complete report on Stanford's examination of gross fission products may be obtained from project 361, Stanford Research Institute, Stanford, Calif., at $1.50 a copy.)

ATOMIC PATENT DIGEST...latest U. S. applications & grants...

Mass spectrograph. A magnetic lens comprising spaced magnets arranged end-to end defining an ion path between them, rigid non-magnetic means inter-connecting the magnets, pivots on the remote sides of the magnets, disposed on a common axis, and means to rotate the magnets on the pivots attached to one of the magnets. U.S. Pat. No. 2,572,600, issued Oct. 23, 1951; assigned to United States of America (USAEC).

Method and apparatus for measuring strong alpha emitters. The combination of an alpha particle emitting material a second material, of the same area as the first, and capable of emitting neutrons upon bombardment by alpha particles from the first material, and a third material, of the same area, which is capable of becoming radioactively excited upon bombardment by neutrons emitted from the second material. This third material is beyond the effective range of alpha particles from the first material. U.S. Pat. No. 2,573,069, issued Oct. 30, 1951; assigned to United States of America (USAEC).

Manufacture of porous articles from trifluorochloroethylene polymer. Comprises cold molding a finely divided powder of this polymer at a pressure in excess of 500 lbs/sq. in.; removing the cold molded polymer from the mold; and thereafter sintering the molded powder by heating at an elevated temperature below 250 deg. C. and within 50 to 100 deg. below the temperature at which the polymer can be hot-molded, and cooling the sintered powder. U.S. Pat. No. 2,573,639, issued Oct. 30, 1951; assigned to United States of America (USAEC).

Gas anaylzer. A system for measuring small quantities of contamination in a gaseous mixture, which comprises: (1) Means for introducing a flow of the mixture from a high pressure area to a low pressure area, (2) Means for regulating the flow of the mixture to the low pressure area, (3) Means for removing the desired components from the mixture, and (4) An ion gauge for measuring the contamination gases as a function of pressure, and a constriction adjustable to a fixed position for providing a large pressure differential between the low pressure area and the location of the ion gauge. U.S. Pat. No. 2,573,649, issued Oct. 30th, 1951; assigned to United States of America (USAEC).

NEW BOOKS & OTHER PUBLICATIONS...in the nuclear field...

Radiologic Physics, by Charles Weyl and S. Reid Warren, Jr. 2nd Ed. A comprehensive text. 491 pages.--Charles C. Thomas, Springfield, Ill. ($10.50)

Handbook of Dangerous Materials, by N. Irving Sax. Covers more than 5,000 hazardous industrial materials, including radioactive materials. Essentially, safety information, for those who handle, store or ship such products. 850 pages. --Rheinhold Publishing Corp., New York 18, N.Y. ($15.00)

Twenty-seven Questions & Answers about Radiation & Radiation Protection. A non-technical, brief discussion about nuclear energy. 17 pages.--Superintendent of Documents, Wash. 25, D.C. (15¢)

Interim Civil Defense Instructions for Schools and Colleges. Suggests types of civil defense education and training which may be set up by schools and colleges. Contains a useful bibliography listing some 16 publications on civil defense most of which were prepared by the Federal Civil Defense Administration.--Superintendent of Documents, Wash. 25, D.C. (30¢)

NOTES: Two papers of interest-"The Availability of Radioisotopes and their Application to Petroleum and Automotive Research", by G.G. Manov, Isotopes Division, USAEC; and "Some Phenomena of Engine Wear as Revealed by the Radioactive Tracer Technique", by H.R. Jackson, F.C. Burk, L.J. Test, & A.T. Cowell, were presented at the Society of Automotive Engineers' meeting in Chicago Oct. 30-Nov. 1, 1951. Preprints of these papers may be obtained from the Society at 29 W. 39th St., New York 18.

A third edition of "Handbook of Emergency Defense Activities" has now been issued by the Superintendent of Documents, Wash. 25, D.C (30¢). The directory lists the names, addresses, and telephone numbers of all Federal agencies active in the defense program.

Sincerely,

The Staff,
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